

breeding in salt water, namely, *Mucidus alternans*, Westwood, *Culex vigilax*, Skuse, and *Nyssorhynchus annulipes*, Walker. In Malta we get *Acartomyia zammitii*, Theobald, in Italy *Culex salinus*, Ficalbi, living in salt water, and others could be mentioned. It would be as inaccurate to say that mosquitoes cannot breed in water on marshy land with peat as it is to say they cannot breed in salt water.

FRED. V. THEOBALD.

### NOTES.

It is announced that Sir Daniel Morris, K.C.M.G., Imperial Commissioner, West Indian Agricultural Department, has resigned his post, which he has occupied with conspicuous success during the past ten years.

It is estimated by an officer of the American Department of Agriculture that the recent forest fires in the United States have caused losses at the rate of a million dollars a day. In New York State alone 44,935 acres were destroyed by the flames by the end of September. The Forestry Bureau at Washington has issued a statement declaring that probably in every instance the fires might have been prevented if the States had provided an adequate number of men to patrol the woods and stop the fires at their beginning, and if lumbermen and others who use the forests had been careful to dispose of brushwood after logging.

The first International Road Congress was opened at Paris on Monday at the Sorbonne, Paris, under the presidency of M. L  thier, Inspector-General of Bridges and Roads. More than two thousand delegates, representing twenty-nine countries, are attending the congress. Among the groups of subjects to be discussed are:—construction and maintenance of roads; general methods of maintenance; wear and dust; traffic and its working; effect of new methods of locomotion upon the roads; the effect of the roads upon vehicles; signals upon the road; roads and services of mechanical transport.

THE winter lectures at the London Institution, Finsbury Circus, London, E.C., will begin on October 26, and continue until the end of February, 1909, two lectures being delivered each week. The programme arranged is of a varied character. Among the lectures we notice the following:—excavations in Memphis, by Prof. W. M. Flinders Petrie, F.R.S.; underground water supply, by Mr. C. Carus-Wilson; sea-urchins and the relation between the individual and its environment, by Dr. J. W. Jenkinson; Mendelian heredity, by Mr. William Bateson, F.R.S.; and the use of oxygen: demonstration of life-saving apparatus for use in mines and submarines, by Mr. Leonard E. Hill, F.R.S.

THE bison range in the Flathead Indian Reservation in Montana, to establish which the United States Congress at its last session appropriated \$8000., has been selected. We learn from *Science* that the range is the one recommended by Prof. Morton J. Elrod, of the University of Montana, after he had examined carefully several parts of the country. It lies directly north of the Jocko River near the towns of Ravalli and Jocko. Approximately 12,800 acres are embraced in the tract, which will be fenced in a substantial manner. Of the amount appropriated, only \$2000. will be available for fencing the range and constructing the shelter sheds and other buildings necessary for the proper maintenance and care of the bison. The remaining \$6000. will be paid to the owners of the land, many of whom are Indians. Funds for the

purchase of bison are being raised under the auspices of the American Bison Society, which was largely instrumental in securing the grant.

ON October 10, in the presence of the leading aeronautical experts of France, Mr. Wilbur Wright, with M. Painlev   as a passenger, accomplished a flight of 1h. 9m. 45.6s. in duration, the distance covered being estimated at nearly seventy kilometres. This successful flight is the last demanded of Mr. Wright by the French syndicate which has acquired the local rights in his aeroplane by the payment of 10,000*l.* at once and 10,000*l.* in a month's time, after three men have been trained to work the machine. The *Daily Mail* states that on November 1 the Soci  t   navale des Chantiers de France will begin at Dunkirk the construction of fifty Wright aeroplanes, which are to be sold at the price of 1000*l.* each. The A  ro Club of France has decided to award to the brothers Orville and Wilbur Wright its grand gold medal for the year 1908.

THE Committee on Ancient Earthworks and Fortified Enclosures, under the chairmanship of Lord Belcarres, has during the past year lost the services of two men who contributed largely to the conservation of these important remains—Mr. I. Chalkley Gould and Sir John Evans. It is satisfactory to learn that Maiden Castle, near Dorchester, has been transferred to the care of the Commissioners of Works; and that mounds at Thetford Castle, in Norfolk, and Waytemore, near Bishop's Stortford, have been taken over by the local authorities. So far only the county councils of Hertfordshire, Leicestershire, London, Staffordshire, the West Riding of York, Galway, and Louth have exercised the powers conferred by the Ancient Monuments Act of 1900. Meanwhile Scotland and Wales have succeeded in procuring the appointment of Royal Commissions to compile an inventory of their local antiquities. It is high time that antiquaries in England pressed for a similar measure, and for the appointment of an Inspector of Ancient Monuments, particularly as much recent damage is reported from various parts of the country. The report of the committee gives interesting details of excavations in progress, and notes some cases in which measures have been taken to check that spirit of vandalism which is now happily decreasing under the watchful care of the local archaeological societies.

THE first meeting of the council of the International Electrotechnical Commission is to be opened by Mr. Balfour on October 19 at the new rooms of the Institution of Electrical Engineers, Victoria Embankment. The commission originated through resolutions of the Government delegates to the St. Louis Electrical Congress in 1904, when it was decided that steps should be taken to secure the cooperation of the technical societies of the world by the appointment of a representative commission to consider the question of the standardisation of the nomenclature and ratings of electrical apparatus and machinery. A preliminary meeting of the International Electrotechnical Commission was held in London in June, 1906, fourteen countries being represented. The chief question which will be discussed next week is that of nomenclature. The subcommittee on nomenclature, under Mr. A. P. Trotter, appointed by the British committee, has been at work during the past year trying to settle the best explanations for the terms in general use in the electrical industry, and has drawn up a preliminary list. The suggestions put forward by the French committee for a provisional standard of light are to be considered, and the subject of the metric system as affecting the work of the commission is also to be discussed.

THE International Conference on Electrical Units and Standards, the constitution and objects of which were described in last week's NATURE, was opened on Monday at the rooms of the Royal Society by Mr. Churchill, M.P., president of the Board of Trade. In the course of his remarks at the opening of the proceedings Mr. Churchill said:—"Fourteen years have passed since the last International Congress, at which definite resolutions were passed as to electric units. The resolutions of Chicago in 1893, based as they were upon the conclusions reached at Edinburgh in the previous year, have formed the starting point of legislation in various countries. The present conference owes its inception to the resolution agreed to by the delegates of many countries four years ago at the great exhibition at St. Louis. That resolution not only confirmed the necessity for a more practical and perfect uniformity of electrical standards through the labours of an international commission, but further expressed the hope that that commission might ultimately be preserved in a permanent form. His Majesty's Government has responded with precision and cordiality to the proposal to convoke an international conference in London. The result of the invitations has been most gratifying. The importance of the work is undoubted, the capacity of the conference is indisputable. It is not within the scope of such a conference to formulate laws for Governments and nations. It is its business to define in clear and accurate expression those scientific quantities in terms of which electric energy is bought and sold, and, if possible, to embody its conclusions in draft articles which may form the basis of legislation and administration, so far as electric units and standards are concerned. While the work of the conference is scientific, it must also be practical. It is of the greatest interest to science to realise, in the most exact manner, the fundamental units of the electrician; but the primary work of the conference is to define and specify standards for the purposes of trade and commerce. Those standards must be definitely fixed in value; they must be permanent, and they must be reproducible. Physicists will continue their researches into the exact relations of those standards to the fundamental units, and each year will make the knowledge of those relations more complete; but the object of the conference is to secure the immense advantage to trade and commerce, by establishing a universal system of standards acceptable to all." After a vote of thanks had been passed to Mr. Churchill, Lord Rayleigh took the chair, and the business of the conference commenced. In the evening the delegates were entertained at dinner by the president and members of the Royal Society Club, and a reception was held by Lord Rayleigh and the council of the Royal Society. As at present arranged, the last meeting of the conference will be held on Wednesday, October 21, and we hope to publish an account of the proceedings in NATURE of the following week.

Nature for September contains the conclusion of Dr. L. Stejneger's article on the relations of the fauna and flora of western Norway. Reference is made to the distribution of certain liver-worts and to the bearing of the newly described *Microtus arvalis exsul* of the Hebrides on the theory of a former land-connection between Scandinavia and Scotland.

INSECTS injurious to local crops in 1907 form the subject of Bulletin No. 251 of the Michigan State Agricultural Experiment Station. Among these, the most harmful appears to be the so-called rose-chaffer, which visits many of the vineyards in millions. It is noted that certain evil-smelling bugs prey upon the potato-beetle.

SOME time ago Dr. F. A. Bather attempted a revision of the nomenclature of the crinoids. The subject has been further elaborated by Mr. A. H. Clark in a paper published as No. 1623 of the Proceedings of the U.S. National Museum. Dr. Bather's conclusions with regard to the names to be used are stated to be incorrect, except in the case of two genera.

No. 4 of vol. v. of the University of Colorado Studies includes a list of Colorado Entomostraca, by Mr. G. S. Dodds. The list is not a long one, but this is probably to a great extent owing to imperfect knowledge, and when collections have been made from the numerous small lakes at elevations between 6000 feet and 1200 feet, it is probable that the number of these organisms will be very largely increased.

WE have received a copy of a second edition of a guide to the Wilberforce Museum at Hull, in which Mr. T. Sheppard gives much interesting information with regard to William Wilberforce and his connection with that city, which was his birthplace. In addition to Wilberforce relics, the building also contains objects connected with the history and trade of Hull, among the latter being a complete collection of whaling implements.

IN a paper on the Ceylon fishery of window-pane oysters (*Placuna placenta*), published in the August number of *Spolia Zeylanica*, Mr. A. Willey describes a certain very remarkable peculiarity in the development of that species. The fact that the largest oysters examined during the inspection in October last were immature leads to the conclusion that *Placuna* does not produce an annual brood, but that one generation succeeds another at intervals longer than one year, and that sexual maturity is attained only after completion of the superficial growth of the shell, the life of individual oysters probably being three years.

IN the September number of the *Zoologist* Mr. H. E. Forrest directs attention to the remarkable difference between the vertebrate faunas of Wales and Ireland, dwelling specially on the absence from the island of moles, short-tailed field-mice, weasels, polecats, reptiles, and several kinds of fresh-water fishes. In explanation it is suggested that the paucity of the Irish fauna may be due to that island having become separated from Great Britain before the latter was cut off from the Continent by the English Channel. The theory of a direct connection between Ireland, Scotland, and western Norway is ignored.

IN an article on wild life in the Murray Swamps, published in the August number of the *Victorian Naturalist*, Mr. A. H. E. Mattingley utters yet another protest against the evil deeds of the plumage-hunters. "Dead and dying egrets," he reports of a certain spot, "were everywhere. The plumage-hunters had been there before me, and the wreck they had left behind made my blood boil with indignation. It would not have been so bad had the slaughter consisted only of the hundred or so of adult birds, but, as these were the parents of three times as many fledgelings, left to die of starvation, you may readily guess how I felt."

WE have been favoured with a copy of the first number of a new work entitled "Wild Beasts of the World," by Mr. F. Finn, published by Messrs. T. C. and E. C. Jack. The work is to be completed in seventeen parts, at the price of 1s. each, and is to be illustrated by 100 coloured quarto plates, six of which are issued in the part now before us. These, which represent apes and monkeys, are

executed in the three-colour process. In the text Mr. Finn relates a fact previously unknown to us, namely, that Kirk's guereza monkey, of Zanzibar, has been exterminated by natives sent by Sir John Kirk himself to ascertain how many individuals survived.

SOME time ago Prof. Prowazek described certain bodies discovered by him in the intestine of the lizard as the reproductive cysts of *Bodo lacertae*, a parasitic flagellate found in the same situation. It was further stated that these "cysts" underwent a unique kind of "autogamic" development, the details of which it will be unnecessary to discuss. At a later date Mr. C. C. Dobell discovered in the intestine of the frog, associated with parasites known as *Octomitus ranae* (which are apparently near relatives of *Bodo*), very similar bodies. These he very naturally regarded in the same light as those described by Prof. Prowazek, but fresh investigations have caused him (as narrated in *Biologisches Centralblatt* for September 1) to come to a very different conclusion. He now decides that the "cysts" in the frog's intestines are yeasts, and suggests that the bodies described by Prof. Prowazek from the lizard are of a similar nature. If this be so, the "autogamous" reproduction of *Bodo* is a myth.

IN order to obtain a better knowledge of the rôle of birds in the economy of nature, a novel kind of ornithological survey was undertaken a year ago in Illinois, a couple of observers in summer marching at a distance of thirty yards apart over long strips of three different districts, and noting the number of birds of each species seen. The total number of birds observed per square mile was 645, or almost exactly one per acre, but by eliminating 1414 interloping European sparrows, the number of native birds was found to be 527 to the square mile. The total number of native birds on this basis for the whole of Illinois works out at 30,750,000, in addition to which are 5,536,000 sparrows. Of the eighty-five species represented by the 7740 birds recognised on the trips, the twenty-one most common species accounted for no less than 6596; in other words, 85 per cent. of the birds belonged to 25 per cent. of the species. It is these abundant species that are alone to be considered in the effects of bird-life on the products of the country.

IN a paper published in vol. xxxiv. (pp. 393-402) of the Proceedings of the U.S. National Museum, Mr. M. W. Lyon expresses his opinion that the placing of the American prong-buck (*Antilocapra*) in a family by itself is not justified by the facts. Its only essential difference from the Bovidae is to be found in the forking and annual shedding of the horns, and the consequent absence of annual rings of growth at their bases. In addition to these characteristics may, however, be mentioned the large number of cutaneous glands (namely, a pair behind the lower jaw, another pair on the ischium, two interdigital pairs, a pair on the hocks, and a single one on the hind part of the back in advance of the rump-patch) in this ruminant. The species should be regarded as representing a subfamily (*Antilocaprinae*) of the Bovidae.

DURING the last twenty years of his life, the late Mr. C. B. Clarke became the recognised authority on the Cyperaceæ, and received species for identification from all parts of the world, whereby he accumulated material for a prospective monograph of the order. On account of its great length the preparation of the work for publication is not at present possible, but the director of Kew Gardens has assigned the eighth volume of the additional series to the Kew Bulletin in the publication of his descriptions

of unrecorded determinations. There is also included an enumeration of all the species in his manuscript ordered according to his proposed classification under generic subdivisions.

WE have been favoured with a copy of the paper, by Mr. F. A. Stockdale, on the fungus diseases of cacao, published in the *West Indian Bulletin* (vol. ix., No. 2). Stem canker and root disease have been chiefly responsible for destruction of trees in the West Indies, but "die-back" of branches caused by *Diplodia cacaoicola* and a pink disease connected with a *Corticium* have been troublesome in St. Lucia, and recent investigations in Trinidad point to the ravages of a species of *Lasiodiplodia*. The pods are liable to be rusted by the *Diplodia* mentioned, or may be infested by *Phytophthora omnivora*, which produces a black rot. Altogether a formidable list of pests is recorded, but, fortunately, most are amenable to treatment, whether this consists in improving the vigour of the trees by tillage or manuring, or in spraying with or without the application of the excising knife.

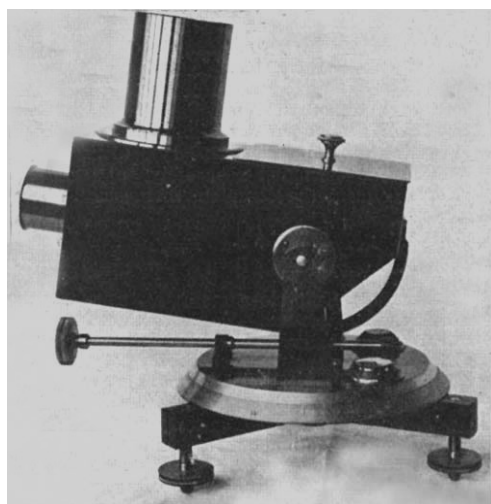
THERE are no stages in the life-history of phanerogams more widely and correctly known than the normal divisions of the nuclei in the embryo-sac or megaspore; the stages at which the "reduction-divisions" take place are not, however, so accurately known. In the *Botanical Gazette* (June) Prof. J. M. Coulter discusses the interpretation of irregular nuclear and cell divisions occurring at these stages. He points out that ordinarily five successive divisions occur from the megaspore mother cell to the fertilisation stage, and observes that the two reduction divisions are essential. In *Lilium* there are only three divisions, of which two should be regarded as reduction divisions forming megaspore nuclei. All these nuclei enter into the structure of the female gametophyte, and there is one subsequent division. *Peperomia* and the Penæaceæ afford difficulties of another kind, but here there has been, in the author's opinion, no additional division of the free nuclei.

THE meteorological year-book of the Bremen Observatory for 1907, published by Dr. P. Bergholz, contains complete hourly observations from automatic instruments with results, and rainfall values for several stations in the neighbourhood. A special feature is made of phenological phenomena; the results are given for the year in question, with means for the years 1896-1907. The work forms one of the excellent year books of the German Empire, and is the eighteenth volume of the Bremen series.

MAURITIUS in 1850 was covered with forests to the extent of about one-third of its area. In 1880 this had been diminished to about one-tenth of the area of the island, and, of course, some of this has been cleared since. In view of the opinions expressed by Mr. Thompson in 1880 and Mr. Gleadow in 1904, that the destruction of the forests had an adverse influence on the climate of the island, Mr. A. Walter, chief assistant of the Royal Alfred Observatory, has made a thorough examination of the data available in order to find some statistical evidence either for or against these opinions ("On the Influence of Forests on Rainfall and the Probable Effect of 'Deboisement' on Agriculture in Mauritius"). Mr. Walter finds in the smoothed rainfall curves extending over the period 1860 to 1907 evidence that the cutting of the forests may have had some little effect on the total fall, but has had more effect on the number of rainy days. The distribution through the year is almost more important than the amount. The rainy days in the districts denuded of forests have been decreased by about

30 days per year, but under such conditions that the amount due to these 30 days is only about 6 to 10 inches, whereas the annual variation of total rainfall is often 60 inches. Before the forests were cut rain fell on many calm afternoons, because the presence of moisture transpired by the trees was sufficient by increasing the humidity and decreasing the pressure to cause slight showers. The rain caused in this way is, however, very local, and apparently Mr. Walter does not recommend any great work and expense in planting trees with the idea of improving the climate generally.

THE exact knowledge of the speed at which the clouds travel is one of the best means of ascertaining the presence, direction, and velocity of certain currents of the upper atmosphere which directly affect aerial navigation. The accompanying illustration shows an instrument designed for this purpose, and manufactured by Richard, of Paris. The apparatus is mounted on a horizontal axis around which it may be turned by means of a long screw. The two supports on which it rests are fixed over a divided brass disc, which may be turned horizontally around an axis placed on a support fitted with three adjustable screws.



The Nephoscope.

Inside the apparatus are two mirrors placed relatively at an angle of  $45^\circ$  in the direction of a spy-hole, through which the operator looks, and towards a reticle consisting of a four-sided piece of glass placed in such a way that the distance between two lines represents the angular space of a degree. The reticle is placed in a tube holding a special system of lenses arranged in such a way that the face of the reticle is reflected in the mirror. It thus happens that on looking through the spy-hole the face of the reticle is seen projected upon the cloud under observation. It is necessary to observe the movement of the cloud and to know its altitude in order to determine the speed at which it is travelling. Two such instruments placed at a known distance apart and observing the same cloud would give the height, and, at the same time, two measurements of the velocity. The mounting of the apparatus on two axes, one vertical and the other horizontal, allows it to be placed at any angle, so that the sky may be explored in every direction.

THE August Bulletin of the Bureau of Standards at Washington contains a paper of 132 pages on the various formulæ for the calculation of the self and mutual inductances of coils, by Messrs. E. B. Rosa and L. Cohen.

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The authors have included all the formulæ which have been found correct, and indicate the conditions under which one or other is to be preferred. The numerical work is carried out in a number of cases in order to show the application of the formulæ, and more than twenty pages of tables to facilitate the calculations are given.

ACCORDING to a communication made to the *Versammlung deutscher Naturforscher und Aerzte* at the recent meeting at Cologne, Prof. H. W. Schmidt and Dr. P. Cermak, of Giessen, have discovered the cause of the different results which have been obtained in experiments to determine the effect of high temperatures on the radio-active properties of substances. They find that if the experiment is made with the radio-active material in a new quartz tube, change of temperature appears to have no effect on the activity of the substance, and that the apparent effect obtained with an old tube is due to the diffusion into and through the material of the tube of the products of decomposition—radium B and C. Although the authors have not yet completed their experiments, they consider they have sufficient evidence to justify the statement that for changes of temperature up to  $1500^\circ$  C. no change of the radio-active properties of substances can be detected by the most sensitive instruments.

It is a well-known fact that when a saturated vapour below its critical temperature has its volume suddenly decreased, some of the vapour is condensed on the walls of the containing vessel, and, in running down them, gives the appearance of ripples. In the *Physical Review* for August, Messrs. W. P. Bradley, A. W. Browne, and C. F. Hale, of the Wesleyan University, Middletown, Connecticut, show that the phenomenon of ripples is also exhibited when the same experiment is carried out with vapour above the critical temperature. They consider that this observation supports the theory that at and above the critical temperature the miscibility of liquid and vapour is unlimited, while below it is limited by the existence of a saturation point. On this view the "area of liquefaction" of the Andrews diagram is really the "area of saturation"; outside it on the side of large volumes liquid may exist, but not in sufficient quantity to saturate the vapour, while outside for small volumes vapour may exist, but not in sufficient quantity to saturate the liquid.

INCREASED importance is year by year attached in our elementary schools to simple instruction in the elementary rules of healthy living. Many easy reading books have been produced to assist teachers in this direction, and among these is Mr. W. Taylor's "First Reader in Health and Temperance," a new edition of which has just been issued by Messrs. George Philip and Son, Ltd., and the Church of England Temperance Society.

A USEFUL catalogue dealing with apparatus suitable for chemical lecture experiments and various forms of lecture lanterns has been received from Messrs. A. Gallenkamp and Co., Ltd. It includes particulars of all the equipment necessary for the performance of the experiments described in the better-known books dealing with chemical lecture demonstrations. In addition to the illustrations and particulars as to the sizes and prices of the instruments, the catalogue provides many hints to teachers as to the way the apparatus should be used and the purposes to which it may be put. The list also contains information concerning the supply of compressed oxygen, and particulars respecting liquid air and the apparatus employed in handling it.

ON previous occasions we have referred in terms of praise to special catalogues, like that of books on the

useful arts, prepared by Mr. Basil Anderton, the public librarian, and published by the Newcastle-upon-Tyne Public Libraries Committee. We have now received a copy of the new catalogue, edited by Mr. Anderton, of the Newcastle-upon-Tyne Central Lending Library, which includes all books in circulation except English fiction, children's books, and books for the blind. The volume consists of 712 pages of large size, and is, in the main, an author catalogue arranged in the alphabetical order of authors' names and writings. A noticeable feature is the introduction, under an author's works, of particulars of books by other writers containing scientific, philosophical, or other criticisms of them. It is satisfactory to find that scientific works occupy a prominent place in the library. The readers of Newcastle-upon-Tyne may be congratulated on the possession of a complete and well-arranged guide to the large number of books at their disposal.

### OUR ASTRONOMICAL COLUMN.

**A NEW SATURNIAN RING.**—A telegram received at the Kiel Centralstelle on October 8 announces that a new, dusky ring surrounding the bright rings of Saturn has been discovered at the Geneva Observatory (Kiel Circular, No. 104).

**COMET MOREHOUSE, 1908c.**—Numerous observations of Morehouse's comet, 1908c, are recorded in No. 4275 of the *Astronomische Nachrichten* (p. 46, October 5).

Some suggestion of change, which may be due to observing conditions, appears in the observations of Prof. E. Millosevich and Dr. Zappa at Rome between September 12 and 17. On the former date the brightness of the comet appeared to be less than at a previous observation, made on September 4, and a tail was suspected extending a little to the west of south. On September 14 the coma showed a nucleus of magnitude 10.5, and the tail extended to a distance of 11' in position-angle 217°. Both coma and tail exhibited an increase of splendour on September 15, the latter extending for some 14' to 15'. On September 16 the coma and nucleus were again brighter, but the tail, in position-angle 228°, was not so well seen; with a clear, moonless sky on the following day this note was confirmed, and the tail was seen to be curved with its convex side towards the east, the position-angle of the tangent at the commencement of the tail being 204°.

At the Moscow Observatory, on September 17, M. P. Sternberg found the comet's head to be about 45" in diameter, and to contain a condensation which exhibited a granular structure. A photograph obtained by Dr. Kostinsky, on September 19, with the 13-inch astrographic telescope, exposure 44m., showed a short fan-like tail extending towards the south; the magnitude of the whole comet was estimated as 8.0.

In the *Comptes rendus* for October 5 M. Bigourdan reports striking changes in the comet's tail. On September 29 it was regular and 20' in length, but on the succeeding night it was irregularly fainter, showing bright patches. At 10h. 24m. on October 1, however, no tail was to be seen, although it was detected again, some 4' or 5' in length, on October 3. All the observations were made with the same instrument.

A new set of elements, by Prof. Kobold, appears in the *Astronomische Nachrichten*, and Prof. Dale has also computed new elements and an ephemeris, which is given below:—

#### Ephemeris, for Greenwich Midnight.

| 1908        | R.A.        | Dec. N.     | log $r$    | log $\Delta$ | Brightness |
|-------------|-------------|-------------|------------|--------------|------------|
|             | h. m.       |             |            |              |            |
| Oct. 16 ... | 19 23.5 ... | 48 1.7 ...  | 0.1778 ... | 0.0107 ...   | 5.4        |
| " 18 ...    | 19 17.9 ... | 44 27.8 ... | 0.1707 ... | 0.0121 ...   | 5.5        |
| " 20 ...    | 19 13.3 ... | 40 55.4 ... | 0.1635 ... | 0.0151 ...   | 5.7        |
| " 22 ...    | 19 9.4 ...  | 37 26.8 ... | 0.1562 ... | 0.0194 ...   | 5.7        |
| " 24 ...    | 19 6.1 ...  | 34 2.8 ...  | 0.1489 ... | 0.0255 ...   | 5.8        |
| " 26 ...    | 19 3.3 ...  | 30 46.0 ... | 0.1415 ... | 0.0332 ...   | 5.8        |
| " 28 ...    | 19 1.0 ...  | 27 36.5 ... | 0.1341 ... | 0.0412 ...   | 5.8        |
| " 30 ...    | 18 59.0 ... | 24 34.3 ... | 0.1264 ... | 0.0495 ...   | 5.7        |

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Observations made at South Kensington on October 10 showed that Prof. Dale's positions are very nearly correct.

**PHOTOMETRIC OBSERVATIONS OF VARIABLE STARS.**—In No. 4275 of the *Astronomische Nachrichten* (p. 33), Herr A. Tass places on record the results of a number of photometric observations of variable stars. The observations were made at the O'Gyalla Observatory during the years 1905, 1906, and 1907.

**A BOLIDE WITH A PERSISTENT TRAIL.**—A number of drawings and a description of the trail of a bolide, observed by M. Quénisset, at Juvisy, on July 31, appear in the October number of the *Bulletin de la Société astronomique de France*. The bolide itself appeared at 11h. 12m., and was sufficiently bright to illuminate the surrounding scenery for about half a second, as though the moon were shining. The trail left by the bolide was visible in a binocular twenty minutes after the apparition, and could be seen with the naked eye for half that time. At first a straight line, the trail afterwards curved up at both ends until finally it became an elliptical nebulous cloud, very like a telescopic comet. During these transformations the whole cloud was displaced, gradually but regularly, in a W.N.W. to E.S.E. direction. When the first drawing was made, the trail was situated about 1° north of, and parallel to, the line joining  $\alpha$  and  $\beta$  Aquarii, the coordinates of its commencement and end being, approximately, 335°, +3°, and 320°, -52°, respectively.

**RADIAL VELOCITY OF ALGOL.**—From measurements of the spectrograms taken at the Pulkowa Observatory during 1905-7, Prof. Belopolsky has derived a set of elements for the orbit of Algol, and publishes it, together with a detailed account of the reduction, in No. 22, vol. xi. (1908), of the *Mitteilungen der Nikolai-Hauptsternwarte zu Pulkowo*. Each of the lines H $\delta$ , H $\gamma$ ,  $\lambda$ 4472 (He),  $\lambda$ 4481 (Mg) and H $\beta$  is discussed separately, and the following elements result from the complete discussion:—

$$\begin{aligned} \omega &= 42^\circ.5 \pm 1^\circ.35 & a &= 1,693,523 \pm 100 \text{ km.} \\ e &= 0.0476 \pm 0.0037 & i &= 90^\circ \\ T &= 2.509 \pm 0.00019 \text{ days} \end{aligned}$$

**THE EFFECT OF STAR-COLOURS UPON THE CONSTANT OF ASTRONOMICAL REFRACTIONS.**—To determine the effect of the colour of the star observed upon the constant of refraction, Mr. Hirayama, of the Tokio Observatory, reduced the observations of Courvoisier, Bauschinger, and Nyrén by dividing their stars into three groups, according to colour, and then deriving the corrections to the assumed value of the constant corresponding to the different colours. The results of the discussion are published by the Tokio Mathematical Society, as a reprint from No. 17, vol. iv. (second series), of the *Tōkyō Sōgaku-Buturigakkwai Kizi*, and show (1) that the effect of the colour of the star upon the constant of refraction is not shown in any single series, (2) the arithmetical mean of the three series to be 60".19 for whitish-yellow stars, 60".16 for yellow stars, and 60".12 for reddish-yellow stars.

**HALLEY'S COMET.**—Prof. Turner's discourse on Halley's comet, given at the recent British Association meeting, has been published by the Clarendon Press at the price of 1s. net. After some general, personal, and historical notes, Prof. Turner describes the several circumstances which led to Halley's sagacious conclusion respecting the periodicity of comets, and then proceeds to describe briefly the conditions under which the coming reappearance of Halley's comet will probably take place. According to the ephemeris prepared by Messrs. Cowell and Crommelin, the comet should enter Pisces, from Aries, in January, 1910, travel westwards towards  $\gamma$  Piscium until the beginning of May, and then, turning eastwards again, travel back through the constellations Cetus, Orion, Monoceros, Hydra, and Sextans. From this it will be seen that observers in the southern hemisphere will be better situated for seeing the comet, and, as Prof. Turner points out, it is just possible that it will be well seen in Tasmania during the total solar eclipse of May 8, 1910. The computed brightness varies from 1.0 on January 2 to 5.8 on May 2, to 1112.0 on May 10, and afterwards decreases to 8.6 on May 30, 1910.